Consideration of the Evidence in Relation to Ionising Radiation and Ischaemic Heart Disease

1. The link between acute high doses (above 0.5 Gray units (Gy)[1]) of low linear energy transfer[2] ionising radiation and damage to the heart and coronary arteries (ischaemic heart disease) is now well established. The evidence comes mainly from studies of the survivors of atomic bombings in Hiroshima and Nagasaki and from studies of patients undergoing radiotherapy treatment with X-rays, such as women being treated for breast cancer. The mechanism is one which involves cell sterilisation or cell death (Little et al 2008. Radiation Research 169: 99-109). Such high levels of exposure have never occurred during routine employment in the United Kingdom, and exposures in the civil nuclear industry are orders of magnitude lower.

2. Evidence for an association at levels of exposure below 0.5 Gy has been growing in recent years, principally from studies of workers in the nuclear industry, and with only a very small evidence base in other industries. However, there is uncertainty at these levels of exposure as to whether a causal relationship exists - given the potential for confounding by factors associated both with ionising radiation and ischaemic heart disease, and the lack, so far, of a plausible biological mechanism (cell killing only occurs at the extremes of exposure described in paragraph 1) (Little et al 2008. Radiation Research 169: 99-109).

3. Significantly from the Council's perspective, occupational estimates in relation to exposure below 0.5 Gy suggest that risks may only become doubled - the normal threshold applied in deciding upon prescription - at levels of exposure which would still be far above those that exist in UK employment practice (McGeoghegan et al 2008. Int J Epidemiol 37: 506-18).

4. Hence, the evidence base falls short of that required for including the disease in the Industrial Injuries Benefit Scheme. The Council will continue to monitor the scientific evidence on this subject.

[1] A Gray Unit is the standard unit for absorbed radiation dose due to ionising radiation.
[2] Low linear energy transfer radiation refers to X-radiation, gamma-radiation and beta-irradiation, but not exposure from alpha particles.